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BELL
TELEPHONE QUARTERLY

JULY, 1922

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American Telephone and Telegraph Company

New York

PRESIDENTS OF BELL SYSTEM IN CONFERENCE AT YAMA FARMS, JUNE, 1922

BELL TELEPHONE QUARTERLY

A MEDIUM OF SUGGESTION
AND A RECORD OF PROGRESS

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What Are We Trying To Do?

The presidents of the Associated Companies of the Bell System met with the executives of the American Telephone and Telegraph Company for a five-day conference at Yama Farms on June 3rd. During the meeting a photograph was taken which appears as a frontispiece in this issue of the Bell Telephone Quarterly.

President H. B. Thayer of the American Telephone and Telegraph Company presided and gives the keynote of the conference in the statement which follows.

EVERY business enterprise, of course, has a purpose. It may be to make money for its owners and nothing more. It must make money if it is sound. Its purpose as well as its methods may be narrowly conceived or the reverse. What is the purpose of the Bell System, and how does it propose to accomplish it? In charting a course it is necessary for a mariner to locate his present position. In defining our objective, it will assist us not only to locate our present position but also to remember how we reached it.

With one or two changes in corporate form, the American Telephone and Telegraph Company's history begins with the invention of the telephone. It took the

telephone as a laboratory model and made it an instrument of national service, a service wider than can be found in any other country, and of a quality not elsewhere approached. In short, its life spans the whole history of the telephone and the character of its service is unrivaled.

The Bell System is the only organization, outside the Federal Government, which carries the whole responsibility for national service. The only other agencies that may come to mind in this connection are the railroads and the telegraphs. But the railroads individually cover only certain sections of the country and there is more than one telegraph company attempting a national telegraph service.

There are certain peculiarities in the Bell System situation and service which must be noted. While it discharges a national function, it is governed by state laws, and in some states must operate through state corporations. This necessitates a number of operating units and a central organization rendering the services for them which can most efficiently and economically be centralized. A consumer may not be directly concerned as to whether or not a distant friend or correspondent has certain facilities or conveniences. He may not be interested in discovering whether this distant correspondent or friend has electric light or electric power for transportation. But it is likely to be of interest to him and possibly may be of vital interest to know that he has a telephone and that it is possible for him to be quickly connected with him. Coordination of functions and the standardization of plant are essential to a national telephone service. They make a central organization necessary and render it efficient and economical.

The operating companies are largely owned by the American Telephone and Telegraph Company. That is owned by more than 200,000 stockholders, investors not speculators, and as the result of conservative financing and careful management, after forty-five years there is back of every dollar of capital stock of the American

Telephone and Telegraph Company approximately two dollars' worth of property.

Having briefly surveyed our present position as a part of the nation's equipment, let us consider what we should try to do in the future.

Can there be any doubt? Is there more than one course open? Is there any difference in interest between the public and our stockholders? I cannot see any. If we serve our stockholders wisely and efficiently, we shall render the largest benefit to the public. The success of the Company depends upon the measure of good-will of the community which it can get and hold. We must give the best and broadest service possible. We must provide a service which will not only keep pace with the growth of the country, but also with the constantly increasing use of the telephone. We must make our charges low enough to enable every person who ought to have a telephone, to have one, and at the same time we must earn enough to attract capital to take care of this growth. To earn more than is necessary to maintain and extend the service, would evidence poor judgment and in the end would be bad business for our stockholders: to earn less would be an injury to the public. There must be no waste. The best brains we have must be applied increasingly to effect economies in construction, maintenance and operation. We must struggle unceasingly for better service and lower rates, but in the interest of the public, as well as of our stockholders, we must resist every misconceived attempt to decrease rates to a point which would make it impossible for the Company to keep up and give the best service any one knows how to give. We cannot have fat years and we must not have lean years.

We must stand by our tested traditions and principles. The Bell System is a continuing organization and it is dedicated to a high and important service. We, who are responsible for its direction, must not temporize. We must have guiding convictions and take a long look into the future. We are responsible to the nation, to our stock-

holders, and to those who come after us, for the continued success of the Bell System. While yielding nothing that is good in our organization and its methods, we must continually strive for whatever is better. Conservatism in principles and progress in methods are the traditions of the Bell System, and they must be maintained.

That is what we are trying to do.

H. B. THAYER.

Some Thoughts on Organization and Executive Work

WHAT is organization? And why is organization? What are the functions of an executive?

We hear a great deal about organization in the business world. We hear that this man is a great organizer, or that man is a capable executive. We still hear at times of "Captains of Industry." We occasionally hear of a good Administrator, although the terms "administrator," "administration," and "administrative" are largely confined to governmental affairs. In business we hear more and more of "Committees" and "Conferences." All of these words and phrases are descriptive of certain types of machinery by which modern business is carried on.

In the hope that others might be stimulated to think about the subject, I have set down some notes as to the significance of these terms. They are simply suggestions based to some extent on personal experience and conviction, and even more upon observation of successful executives in their work.

In the first place, we are not in the business of being organizers as such, or executives for the sake of being executives—though indeed one might believe the reverse of this to be true, judging by the requests for employment which we frequently receive from men who "want a job as an organizer or an executive." These men might almost as well say they would like a job somewhere as a captain, and feel perfectly well qualified to fill the job whether it be a captain in the army or captain of an ocean liner.

Organization and all the machinery associated with it are not ends in themselves, but tools for the accomplishment of some desired result. This seems too obvious to need to be stated; but it is easy to forget the obvious unless we are constantly on guard. We must constantly study our organization to see if it is best fitted to give

results. Moreover, we must not overlook the fact that while it is a tool, and in most cases an indispensable tool, it is not the only tool needed for accomplishment.

Organization is a rather simple tool to construct. The difficulty lies in first analyzing clearly the job to be done. For example, here are five men who want to unite to build a cooperative apartment house. Each of the five must not start off independently to buy lumber or engage an architect or dig the foundations. They must first lay out and plan what they want and then determine what needs to be done to secure what they want. After this has been done, the problem becomes one of setting up the organization. This involves a decision as to what part each can do best, and an agreement that some one of the five shall be in charge of coordinating the work.

Organization a Means to an End

Organization means order. We may of course become so fascinated with organization in itself and for itself, with the game of organizing, that we overdo it. We may, for instance, become so enamored of organization charts that because a particular set-up, which we know works well and is useful, cannot be charted, we change the organization.

There are real temptations to the lover of order and system. His protection lies in constantly keeping in mind the end to be attained and making all of his plans with that end in view. To be a good organizer requires sound judgment, ability clearly to perceive the goal sought, an analytical mind, and a certain fondness for order. A real organizer is always creative: it requires a man with a creative imagination clearly to perceive the goal sought.

Many of us are asked from time to time for a good book on organization. It is true that much could be written on the fundamental principles of organization, but no book could be written which would properly instruct exactly how any particular work or business

should be organized. Study and books may help define the problem somewhat and perhaps lay down some fundamental principles which will assist in solving it, but no text-book where you would find your problem stated and the answer given in the back of the book would be a safe guide.

There is nothing mathematical about organization in business. It is true, for instance, that probably no chief executive should have more than five or seven people reporting to him. This, however, is due to the average limitations on the part of the average man to direct and coordinate comfortably a number of functions. The exceptional man might find it quite possible to carry on his work as a chief executive with as many as twelve people reporting to him, or another man who might also be successful as an executive might prefer only three. In other words, you can never escape from the human side of the business and the fact that you are dealing not with machines but with human beings. So that even after you have organized your job and laid out the theoretical organization which can best accomplish it, you will almost always find it necessary to make variations from this theoretically sound organization to meet the peculiarities and temperaments of the individuals who are to carry on the work. It is always a good plan to have the ideal in mind and to work toward it; but by all means do not try to crowd human beings into a theoretical scheme when they do not fit.

Duties of an Executive

The executive may be merely an executive; that is, he may carry out plans and programs which have been laid down for him. That is in fact the primary job of an executive. He must deal with men and women; therefore he must have sympathy, tact, and force, and must know when to be firm and when to be conciliatory. His must not be a single-track mind—he must be alert and able to see many things at the same time, but must not permit himself to be overwhelmed by details. He must

always watch for actual results—must know the difference between real accomplishment and making a show of accomplishment. Above all must he be just and fair in his treatment of his subordinates, and should always be a leader.

An executive generally must be even more than this. He must be also an administrator. That is, he is not only expected to carry out plans laid down for him, but he is expected in part to make plans and carry them out on his own initiative and to assist in determining broad policies for the business as a whole. He must therefore have initiative, imagination, and judgment. These qualities are inherent; they cannot be acquired. They can, however, be improved by training and experience.

There are several ways of performing the functions of an executive. Sometimes a man's personality will enable him to be a good executive even though he disregard many of the generally accepted methods of supervising a large organization. Generally speaking, however, a good executive should not be too busy. This is particularly true if in addition to being an executive he is to do some general administrative work. The mistake should not be made, however, of assuming that because an executive's desk is always clear, he is a good executive. It is an admirable thing to have a clear desk, but with it must go certain principles of work which will keep the executive in touch with his department and enable him to impress his personality upon it.

More Than a Clearing-house

I remember once hearing of a boy who asked a man what sort of work he did in a company. The man was a high executive. His reply stated his job too modestly, but it illustrates the point. He replied that people came in to see him, stated what they wanted to know, and then he referred them to the proper department of the organization. The boy said he understood perfectly, because in his father's business they had an usher—he sat at the desk out in the hall—who did just that. An executive who does just that may really be somewhat

more than an usher, but not much. He does not impress his personality upon his work. He is merely a sort of clearing-house.

It is necessary, of course, for an executive to see that work is properly distributed and coordinated in his organization, but it is also necessary for him to keep in constant touch with his men and with the work which is being done under him. He should always be available to his immediate subordinates. In my opinion, this is more important than that he should be accessible to people outside of his organization. He should discuss their problems with his subordinates and give them the benefit of his advice, and avail himself of every means of keeping in touch with them and keeping them in touch with him.

Besides this, an executive should have some line of contact with the men in his organization below the rank of those who report immediately to him. He should call for information from anyone in his organization from time to time—although, of course, he should never issue instructions or orders except through his immediate subordinates. By thus calling for information from anyone he is able to get a first-hand knowledge of the men working in the business and of their mental attitude toward their work. This seems to me a very important point, although its soundness from an organization standpoint is frequently questioned. People who are in love with organization as such feel that everything should "follow the lines of organization," with the result that a single fact wanted will often have to be requested through eight or ten people and after the fact is ascertained will have to be reported back through the same eight or ten people. Such a procedure reminds one of the old nursery rhyme, "Stick won't beat dog, dog won't bite cat," etc.

Getting the Work Done

It cannot be too frequently stated that really to be effective an executive must always keep his mind on

what it is that he is trying to accomplish. Of course this will never be anything but what is for the good of the business. So it be consistent with the good of the business, ambition is a good thing, but the desire for self-aggrandizement and the desire for power not as a means to an end but as an end in itself, are most serious human failings to be dealt with in running an organization. From the standpoint of getting the work done, it often makes no material difference whether a particular line of work is in one branch of the organization or in another. The organization as a whole will never function without cooperation between the branches, and with cooperation, the placing of work in one department rather than another is often of no material consequence. A desire, however, on the part of one executive to build larger at the expense of some other executive is very often a cause of friction and difficulty. With the successful executive the problem is not one of finding additional work to add to his organization, but of preventing jobs which do not belong to his organization being assigned to it. The executive who works hard to add to the size of his department condemns himself as a good executive.

Another difficulty in the practical operation of a large organization is frequently due to a lack of clear definition of responsibility and authority. Every executive is entitled to know clearly where his responsibilities begin and end, and he is entitled to have definitely the authority which will enable him to meet his responsibilities. Not only is every executive entitled to this, but when he in turn divides up his responsibilities and authorities among his immediate subordinates he must be especially careful to see that those authorities and responsibilities are clearly defined and understood. He cannot under any condition blame a subordinate for something for which the subordinate has no authority because without authority he cannot properly be held responsible.

A good executive realizes that there are a good many ways, and probably several very effective ways, of

accomplishing a given result. He will have no foolish pride of opinion, no troublesome prepossessions. He will welcome intelligent opposition and suggestion from anyone and be quick to surrender a prejudice. While he will impress his personality on his organization, he will not insist that everything be done his way, as this will kill initiative and enthusiasm and make his organization a mere machine.

A Good Judge of Men

Finally, a good executive must be a first-rate judge of men. Perhaps his most important task is the selecting of his department heads. If he does this wisely and successfully, a good part of his task is done. Having selected them, he must trust, inspire, and lead them. He must command and retain their confidence and must be frank with them and fair to them. A successful general is one under whose leadership a staff and rank and file will work and die with enthusiasm.

While authority and responsibility must be clearly defined for executive work, there is, as I have already pointed out, another type of work which I have called administrative. It is not altogether possible to define the authority and responsibility for administrative work. The responsibility for such work is to some extent joint with all the higher executives of an organization. The final decision undoubtedly rests with the head of the organization, but he will wish to take counsel frequently with those who are not primarily responsible for the matter under discussion.

This counsel the chief executive may obtain by discussions with one individual at a time, possibly asking the opinion only of those whose judgment concerning the matter in question is especially valued. Some executives from temperament or even preference have been known to follow this plan only.

It is my personal belief that by far the best results are obtained by Conference. To some minds Conferences are a waste of time. Much is said that does not appear

to bear upon the point under discussion. There is often a good deal of talk, but when important matters of policy are to be decided, I feel sure that the time used or even used up in conferences is very much worth while. When the chaff has been winnowed out, the wheat will be found.

It is important in a conference that everyone be given an opportunity to talk at length, that ideas expressed be listened to with tolerance by all. A prominent man once said that people's personalities and peculiarities meant no more to him than the weather. While this is going too far, nevertheless a conference held with a view to determining policies is not a place where tact and finesse are so necessary as freedom of speech. I realize that in business, one-man authority and responsibility, with the speed of action which results therefrom, is thought by many to be a great deal more effective than the slower process of conferences. I feel sure, however, that in an organization where large matters are at stake and where military authority and discipline are not required, the only safe and efficient way to determine policies is to confer deliberately and at length. Of course, the head of the organization must finally decide, and after deciding, act with firmness and confidence.

The Uses of Committees

Another type of machinery, excellent for the accomplishment of certain results, is the "Committee." A committee differs in my mind from a conference in that it usually has definite responsibility and authority and acts by unanimous or majority vote. The committee is a slow way of accomplishing results, but where several branches of an organization are involved and each is responsible for a part of the answer, it is proper under some circumstances that the final decision should be made by a committee in which every part of the organization represented thereon assumes joint responsibility. The race is not always to the swift, and to accomplish our end which we are constantly keeping in sight, in

some circumstances a committee is a splendid piece of machinery.

A committee, it seems to me, should always have a chairman. I recall an incident during the war when the Secretary of War appointed a number of committees, each composed of representatives of our army and some of the Allied military representatives who were in Washington. The committees were appointed without chairmen. A most distinguished representative of one of our Allies respectfully suggested to the Secretary that their experience in the war had shown committees to be of little value unless a chairman, or at least a "convener," were appointed. No action was taken, however, and the next day the inevitable happened: the committees failed to meet, no one knew who was to call meetings, and in fact no one was quite sure who his associates were on the committees. It was a very striking example of the failure of committee work to function properly without a chairman or at least a "convener."

Organization inherently imposes some restrictions upon freedom. Organization means teamwork, and teamwork means working for the good of the team. Pride of authorship, desire to be personally in the limelight, any tendency to build up one's own reputation by criticizing or belittling others, are all disastrous to the successful working of an organization. After all, common sense and hard work, combined with a sympathetic consideration for others and pride in the institution will result in each man going ahead as far as his inherent abilities will permit, in spite of the size and complexity of large organizations. "Captains of industry" belong to the pioneer days that are past. Large modern business organizations require executives who are also wise administrators. It is the day of statesmanship in business.

W. S. GIFFORD.

Sleet Storms

IT is very pleasant, opening the front door on the morning after a sleet storm, to look upon the fairy-land to which the familiar surroundings have been suddenly transformed. The wind has ceased and the tall trees, encased in ice which sparkles like diamonds in the sunlight, are very beautiful as viewed upon their background of blue sky. Delicate icicles are pendent everywhere and flocculent masses of snow upon bushes and fences are glazed with a coating of glittering ice enamel. You observe with some regret how the sleet has crushed the bushes and that the trees have lost many of their boughs. However, this does not spoil the frosty splendor of the morning. Returning indoors you take down your telephone to find that it is out of commission. The same sort of icy load which has maimed your trees and hundreds of others in the vicinity has also broken down hundreds—perhaps thousands—of telephone circuits, destroying in a night property which was months or years in building.

In the early days in the telephone business the exchange distribution plant and the toll lines were entirely aerial and exposed to the weather. As a result of years of research and development work carried on by telephone engineers, means have been developed whereby it has become possible to place a great part of the exchange distribution plant in underground and aerial cables where it is well protected from damage by sleet storms; cables have been developed in recent years for toll circuits which are economical under certain conditions.

Despite the development of greatly improved types of outside plant and the investment of many millions of dollars in its installation, there remains and probably will long remain a very considerable amount of plant which is exposed to weather conditions. It is not economical, even though it might be technically possible, to provide the extremely expensive types of protected cable routes unless the number of circuits is sufficiently large to

reduce the cost of their installation and operation to a point somewhere near the costs of aerial wire circuits; to do otherwise would result in making the cost of service too great for the average user.

However, the types of aerial plant now in use are such as to withstand all weather conditions excepting storms of a violent character. Sleet storms cause the most damage and in these days constitute about the only adversary, short of some general catastrophe, which can stop the service for more than a very brief space of time.

The Combination of Ice and Wind

The damage done by sleet to the wire plant of a telephone system is more severe and diasatrous where the duration of the storm is considerable, especially if accompanied by high winds. Sleet is by nature the precipitation of water vapor, condensed in the upper atmosphere, which approaches the ground in a partly frozen condition. Its beginning may be either as rain, in which case to turn to sleet it must fall into a stratum of air colder than that in which it originated, or as snow, in which case the opposite must have taken place; that is, the snow in its descent must have encountered an air temperature slightly above freezing point. Under typical sleet conditions the chilled rain falls upon the trees, telephone wires and other objects, and through a decline in the temperature is frozen thereupon. The freezing process continues as long as the rain continues to fall and the temperature does not rise. The icy coating may grow until the accumulated weight becomes enormous and the stoutest structures barely support their burden.

If sleet falls for a number of hours, each single telephone wire may acquire a solid ice coating three inches thick vertically and accompanied by even longer icicles. Whereas the weight of the wires in the normal span between two poles in a 40 wire lead is less than 200 pounds, such an ice coating may add a weight of about 15,000 pounds to the load supported by each pole. If a heavy gale is blowing, the pole is further subjected to a

bending force due to the wind pressure on the sleet-covered wires. Subjected to such tremendous stress, the line frequently fails. When the line might stand the strain, nearby trees are often crushed or blown down upon it, bearing it to the ground and smothering it with masses of shattered boughs. The forces which nature unloosens in the sleet storm are too powerful for us to contend with. We have to suffer the blow, be it what it may, then clear away the debris and make a fresh start.

Last Winter's Storm Toll

The winter of 1921–22 distinguished itself by some terrific storms, making it memorable to many thousands of telephone workers.

On November 27, 28 and 29, 1921, a storm of unusual violence swept the New England States. This was the earliest storm of last winter; the latest was on April 10, 1922, when Minnesota and Nebraska were visited by a storm which destroyed over 21,000 poles of the Northwestern Bell Telephone Company, disrupting the telephone service at more than 70 exchanges. On January 25, 1922, a heavy storm traveled Northwest through North and South Carolina, the sleet continuing intermittently three days and three nights. The City of Savannah, down in the "Sunny South," was covered with a mantle of ice. A newspaper account states that "Fairyland in all its glory could not have presented a prettier sight." However, the conditions held no charm for the telephone construction men as the rain continued for several days after the storm and it was only after the hardest kind of a fight in rain, mud, slush and swamp that service was eventually re-established.

In Michigan and Wisconsin a storm of unusual severity raged over a wide area on February 21st, 22d and 23d. The damage to the telephone plants in both of these states was enormous. The Storm King was evidently not satisfied with his efforts in Michigan, for on March 29th he most unexpectedly re-visited that

state and again destroyed an immense quantity of plant. There is room for disagreement with King Sleet as to the thoroughness of his first onslaught, for he made an almost complete wreck of the wire systems throughout the Northern half of the main peninsula of Michigan. Succeeded as it was by bitter cold and high winds, the storm cut off from all communication with the outside world some dozens of cities, towns and hamlets. The residents of these places were without telephone or telegraph communication, without mail or railroad service, without electric light or power. It was dangerous to walk along the streets because of falling branches, trees, wires, signs or roofing material. Life in this section slowed down almost to a standstill. The plants of many small public utilities were practically wiped out, and in some cases resulting financial ruin so far deters their reconstruction.

The Work of Restoration

As the extent of the storm became evident the Michigan State Telephone Company organized for the work of restoration on a huge scale. Supplies of all sorts in immense quantity were rushed to strategic points for distribution, without waiting to learn precisely where and in what amount the poles, wires and other items would be required. Crews of men were recruited and equipped and sent forward by rail as far as possible and thence on snowshoes. The distribution of the extremely heavy telephone equipment presented a most difficult task. Even with chains on all four wheels, trucks could not operate; horses could not be kept on the roads. Only by dint of Herculean efforts on the part of the men were the stores pushed into the devastated districts.

So aggressively, however, was the work carried on that by the middle of March circuits had been restored to all Michigan State Telephone Company points. Many had been re-established it is true in temporary form, but every town on the Bell routes was again connected up with the outside world.

North of the sleet area in Michigan there was one of the hardest snowstorms that the inhabitants have any knowledge of. Snow was piled fifteen and twenty feet deep. Buildings such as small barns, granaries and coops were literally buried. It illustrates the difference between sleet and snow storms that in the snow belt the Bell toll lines and exchange plant stood up very well, in contrast to the havoc further South.

Wisconsin's Experience Typical

The conditions in Wisconsin were very similar to those in Michigan. The following extracts from a report by the Bell representative at Oshkosh are typical:

> "Everybody was on the job early the morning of the twenty-second and we were all needed. Wires, poles, crossarms and trees were groaning under their load of solid ice and commencing to fall. Ole Rasmussen started North on the Marinette line and got out as far as Jackson Street road, when the big fifty-foot poles began to fall around him. Ole was completely penned in with his machine by poles falling in front and behind him and he was mighty lucky to escape injury or possibly death. He walked back to the office, delivered his report, then, nothing daunted, headed North again on foot.
>
> "At 6 P.M. there was no possible way to get word into headquarters at Appleton; trains were at a standstill, trolley lines and other modes of transportation out of the question. One of our men waited all night at the depot, but could get no information as to the probable movement of trains. On the morning of the twenty-third, Oscar Bahr and Charles Erbersberger volunteered to walk it. They took our reports and in the teeth of the blizzard they headed North. They fought their way through and arrived at Neenah at 4 P.M. with a complete report of line conditions between Fond du Lac and Neenah which they delivered to the district wire chief, Carl Thomas, who had come down from Appleton. Oshkosh was in darkness and there was no power for three days, but thanks to the emergency gas engine we managed to keep things going."

How the storm affected the telephone girls can be glimpsed from the following report by a supervisor at Superior, Wis.:

> "J. E. Bonnell, district traffic supervisor, Eau Claire district, had arrived in Superior early Tuesday afternoon. Upon

attempting to reach the office next morning, he encountered a large snowdrift immediately in front of the hotel and in the center of the drift, a young lady, almost exhausted from her efforts to get through. Investigation disclosed that it was one of the operators, Miss Crowley, who, notwithstanding her diminutive size, had battled her way six blocks to get to work. At about this time, William Deharde, wire chief, came along and after a time they reached the office. They found the night force still on duty and in addition the chief operator and assistant and two or three of the day girls. These people were almost exhausted from their fight to reach the office but were bravely tackling the job of rendering telephone service to a storm-bound city. At about 8:30 A.M., twelve girls had arrived and breakfast was obtained for the night force. Folding cots and blankets were also provided and a supply of dry clothing for those who had come through the storm. Miss Gilbert, local supervisor, came in after fighting her way through twenty blocks of drifts and storm, and after changing to dry clothing and resting a bit took her place at the board. From this time on the girls came in one by one, some in overalls and boots, others in hiking clothes and still others in their ordinary street clothes; all wet and cold but ready to help in relieving the load of the others. By eleven a force of twenty-five people had arrived and in the afternoon six others reported; the load was being handled in nice shape and the regular reliefs were started. Those operators who lived within two or three blocks of the office made their way to their homes to sleep and the balance either slept on the cots provided at the office or at the hotel."

The Damage in New England

The three days' storm which smote the New England States in November last, began on Saturday, the 26th, with a light drizzling rain which continued almost constantly during the next two days. Early Sunday morning the freezing process began and the rain froze rapidly upon anything it touched. On Sunday afternoon the first total telephone failures were reported and by the early hours of Monday trouble was widespread in general. The Southern parts of New Hampshire, Vermont and Maine, all of Massachusetts, except the seacoast, and portions of Rhode Island and Connecticut were literally overwhelmed. The country in the afflicted areas looked much as it must have appeared in the ice age; the sleet-

covered trees looked like glaciers adrift in a sea of ice. Highways were like rivers of smooth, unbroken ice bearing the ruin of great trees, thousands of fallen telephone poles and a confusion of debris carried by the furious wind. Thousands of miles of costly copper wire, ice-coated, strewed the highways in hopelessly tangled and twisted masses. The work of clearing the wreckage and renewing telephone service was both arduous and dangerous. Work was begun long before daybreak and continued far into the night. One man tells of seeing an emergency cable spliced by the light of a bonfire built of limbs of trees torn off by the storm. At the time it was bitterly cold and so dark that a man fifteen feet from the fire was invisible. From the same locality comes a story of two linemen who carried an emergency cable through a swamp, waist deep in icy mud, climbed out, dried off before a roaring fire and resumed their work. Men frequently labored with trees and wires falling about them. One foreman saw eighteen poles come down in a row near where he was working. The breaking of a pole was accompanied by a crack like the report of a rifle, followed by a loud crackling as the ice was shaken from hundreds of feet of telephone wire, then came a "boom" like the distant roar of a big gun as the heavy pole crashed to the earth.

Heavy Supply Requirements

The restoration of the Bell telephone service after the several storms of last winter was in each case effected with reasonable promptness. The fine spirit of the employees was everywhere evinced and some idea of the quantity of materials which the Western Electric Company was called upon to deliver this winter on emergency shipments may be had by reference to the following list of a few principal items ordered following the storms in New England in November, and in Michigan and Wisconsin in February:

10,000 poles
20,000 crossarms
42,000,000 feet of bare copper wire
8,000,000 feet of covered wire
420,000 glass insulators

The assembly and shipment of these major items together with much miscellaneous material was entirely completed in nine days in each case, more than 50 per cent. of the whole being shipped in the first three days.

Loss Due to Storms Provided For

The losses in the property investment occasioned by sleet storms are, under the standard accounting of the Bell Companies, provided for, like other depreciation losses, by the reserve for depreciation. Suitable reserves are, of course, imperative in view of the hazards to which the telephone plant is exposed, both from the standpoint of the company, whose property may be destroyed and revenue cut off, and from that of patrons whose business and social needs require substantial continuity of telephone service.

The depreciation reserves of the Bell System are built up by charging to operating expenses regularly in monthly installments the amounts necessary, on the average, to provide for depreciation costs—including those caused by storms—during the service life of plant. This is the sound policy for the protection of the investor in Bell Telephone securities. In its absence the sleet losses of the past winter would be at this time a most dangerous and unsettling financial factor. As matters actually stand, the reserves of the Companies are charged and will absorb, without detriment to the investors, the entire storm depreciation costs, which were in excess of $7,500,000. This covers only the original cost of the plant destroyed and the cost of extraordinary repairs, including temporary facilities used in restoring service, minus net credits for salvage recovered. While an immediate expenditure of cash capital is required to reconstruct the

plant, this new capital is represented by new plant. In addition there must be reckoned the very considerable losses in revenue due to plant being temporarily out of service. Such losses cannot, of course, be charged as expense but must be absorbed by the telephone companies out of their margin of surplus earnings of the past. Of the total storm destruction mentioned, the New England Bell Telephone Companies suffered to the extent of more than one and a half millions of dollars. The damage to the Long Lines Department of the American Telephone and Telegraph Company was nearly one million dollars. The damages to the Wisconsin Telephone Company and Michigan State Telephone Company were approximately two millions of dollars. The Northwestern Bell Telephone Company had over nine hundred thousand dollars of plant destroyed, and The Pacific Telephone and Telegraph Company about six hundred thousand dollars. Not a single Bell Telephone Company in the country escaped. This storm damage is recognized as a part of the cost of furnishing telephone service. Some years it is heavier than others, but it is always a factor.

ALLEN B. CRUNDEN.

The Recent Parliamentary Investigation of the Telephone Situation in Great Britain

THE telephone system of Great Britain comprises about 1,000,000 telephone stations, together with some 450,000 miles of toll, or "trunk," wires. The whole telephone plant is now owned by the British Government, with the exception of the local exchanges in the city of Hull and on the island of Guernsey in the English Channel, which are owned by the respective local authorities. The Government system is operated by the Post Office, which also operates the national telegraph system as well as the postal service.

British Telephone History

While the operation of telephone service in Great Britain is now practically entirely in the hands of the Government, the telephone was introduced (in 1878) and was first developed by private companies. Almost from the very beginning of the service, however, the attitude of the Government was distinctly unfavorable to its development under private auspices. Ten years before the introduction of the telephone, legislation had been enacted which declared the operation of public telegraph service to be a Government monopoly, and the Government had accordingly acquired the various privately owned telegraph properties. Telephone service had not long been in operation before the Postmaster General secured a court decision to the effect that a telephone system was a telegraph system within the meaning of the provisions of the Act creating the Government telegraph monopoly. Upon this decision the Government did not at once acquire the private telephone systems as it was empowered to do, but adopted a policy of issuing limited licenses to private telephone companies. The terms of these licenses were such as to impede rather than to stimulate the development of the telephone business. They imposed restrictions upon the companies as to areas of activity and the acquisition of rights-of-

way; they levied a substantial royalty upon the gross earnings of the companies; and, finally, the licenses terminated in 1911 with no provision for the conduct of the business thereafter. Even under these restrictive licenses, however, a number of private companies undertook to develop telephone service in the various parts of the country; but by 1892 the various small companies had been consolidated into the largest company, the National Telephone Company, Ltd. In 1896 the toll lines of the National Telephone Company were acquired by the Government and the operation of the lines thereafter was given over to the Post Office. Local telephone service, however, was still left in the hands of the National Company.

At this stage in the history of British telephony there arose a theory that competition in the telephone business would be desirable from the standpoint of both rates and service; and in 1899 legislation was enacted permitting municipalities to establish and operate telephone systems in competition with local exchanges of the National Telephone Company. But while telephone competition had considerable support in theory, it made little progress in actual practice. Very few municipalities took advantage of the legal authority accorded them to enter the telephone business; and of the municipal systems actually established only the two already mentioned—those at Hull and Guernsey—have survived up to the present time. In 1900, the Post Office undertook the construction of a competing exchange in London; but even before this exchange had been completed and brought into operation, the Government recognized the futility of telephone competition and in 1901 made an agreement with the National Telephone Company which provided for a division of the London business, with identical rates and free intercommunication. In 1905 the Government, having definitely decided not to extend the license of the National Telephone Company, agreed to purchase the entire property of the Company at the expiration of its license in 1911. The property

thus acquired, comprising 561,738 stations, was turned over to the Post Office.

Restrictive Influences upon Telephone Development

So far as underlying physical and economic conditions are concerned, it might reasonably be expected that the telephone development of Great Britain would be as high as, if not higher than, that in any other country in the world. The territory of Great Britain is compact and is densely inhabited by a homogeneous population; her activities are chiefly industrial and commercial, and she ranks high in point of national wealth. As a matter of fact, however, the telephone development of Great Britain is exceeded by that of a number of other foreign countries, and in comparison with that in the United States is very low indeed. At the end of 1921 the number of telephones per 100 population was only 2.2 in Great Britain, as against 12.8 in the United States.

It is perhaps true that the British people are characterized by a certain conservatism towards the adoption of new methods, such as those involved in a widespread use of the telephone. But the failure of Great Britain to attain a telephone development commensurate with her natural advantages may be attributed only in small part to the influence of national habits. Undoubtedly the chief causes of the relative backwardness of British telephone development are to be found in conditions arising out of the relationship of the Government to the service. Governmental authority assumed virtual control of the telephone when the new art was first introduced into the country. The Government at once committed itself to a policy which, by the restrictive provisions incorporated in the franchises of the companies, distinctly hampered the free development of the service by private enterprise. By the time that efficient and adequate toll service had become an important factor in stimulating telephone growth, the

Government had already acquired all the toll lines of the country and development was retarded by an insufficiency of toll facilities, with resulting adverse reactions upon service, which still persists. Moreover, at the stage of telephone progress when, judging from experience in the United States, a very rapid expansion, aided by proper rate policies, might have been expected through the extension of the service among the smaller users—with the consequent increase in the value of the service to the larger users—the Government further restricted the incentive of private enterprise by indicating that the National Telephone Company's license would not be extended after its expiration in 1911. The actual acquisition by the Government of the entire control and operation of the service in 1911 was a natural culmination of a policy adopted thirty years previously.

The Latest Parliamentary Investigation

Public dissatisfaction with the British telephone service has been vigorously expressed for years. This dissatisfaction has been evidenced by constant criticism on the part of the press, by frequent complaints by public bodies, and by investigations by special committees of Parliament. The adverse criticism has been directed not against the character of the plant and equipment, which is in general comparable with the character of the physical property of the telephone systems in this country, but rather against the defects in the scheme of administrative organization of the service and the resultant limitations upon efficient and economical operation. The purpose of this article, however, is not to analyze the deficiencies which have been pointed out in these criticisms, but merely to consider the more important aspects of the present telephone situation in so far as they are disclosed by the recent report of the latest Parliamentary investigation.

In 1920, a proposal involving further considerable general increases in telephone rates—a substantial increase in rates had been effected during the war period—

was brought forward by the Post Office authorities after an investigation by a Departmental Committee on Telephone Rates. Strong public opposition to this proposal developed, and a Parliamentary committee was appointed, which, after a short investigation, approved the increases desired by the Post Office; and these increases were put into full effect April 1, 1921. Public dissatisfaction with the new rates continued, however, and assumed such proportions that the Government felt it advisable to have a second Parliamentary committee appointed "to inquire into the organisation and administration of the Telephone Service and the method of making charges." This committee was not able to complete its work before the close of the Parliamentary session of 1921, and early in 1922 its members were reappointed to constitute a third committee to complete the investigations of the second committee and to report its findings upon those matters which had been included within the scope of the second committee's inquiry.

In March, 1922, this third committee submitted a report* embodying its conclusions based upon the voluminous testimony taken by its predecessors, including memoranda of investigations made by members and representatives sent to the Continent and to the United States.

There is no indication that the Committee was influenced by political considerations; its report was a unanimous one, and impartiality and breadth of view are evident throughout its pages. This fact is important, because the impartiality and thoroughness of the Committee not only lend added weight to its formal conclusions, but also put significance into some statements in its report which might otherwise pass with little notice. At the same time, it should be borne in mind that the members of the Committee were, of course, not experienced in telephone operations; however, their suggestions as to the organization and business aspects of the

*Report from the Select Committee on the Telephone Service 1922, together with the Proceedings of the Committee. Ordered, by the House of Commons, to be printed, 20th March, 1922.

telephone service can undoubtedly be regarded as well founded.

At the very beginning of the Committee's report occurs this significant statement:

> "Before dealing in detail with the terms of the reference, it seems proper to mention one observation or conclusion which has a general bearing. We have been impressed with the capacity, assiduity and single-mindedness of the officials of the Post Office who have given testimony before us. They are men devoted to the public service, keenly watchful for its welfare, well skilled in their calling, untiring in their efforts, and with an intimate knowledge of their duties. Yet there is something wanting. No one acquainted with the evidence before your Committee can fail to be struck with the almost universal antagonism—often, it may be, unreasonable—manifested so widely and persistently against British telephone administration. From study of or personal experience in the Scandinavian kingdoms your Committee learn that this spirit is not so prevalent there, nor in Canada, nor in the United States, nor in Switzerland. The public in those countries are more disposed to approve the telephone management, and when they do not, they enter, in a sense, into friendly partnership with it to discuss alterations and devise improvements. In the British Isles this disposition is conspicuously absent. The public have little mind to help the Post Office, which we think unfortunate; the Post Office, on the other hand, have given some ground for saying that it appears to believe that the public was made for the Post Office, and not the Post Office for the public. It tends too much to a cast-iron application of regulations in an improper way. We do not wish to lay undue stress upon these characteristics, but we cannot leave them out of sight in submitting this Report."

The above passage is significant in emphasizing the necessity for the cultivation of good relations between a public service and the public served.

Matters of Organization

In dealing in detail with the question of the organization of the telephone service, the most important aspect which is discussed in the Committee's report is the proposal, often made before, that the operation of the telephone and telegraph services be separated from that of the postal service. The Committee recognized

that the wire services are commercial in character to a greater degree than the mail service, and are much more technical. To quote—

> "We have given much consideration to the question whether the Telegraph and Telephone Departments of the Post Office should be separated from the Postal Department or not. So far back as 1898 a Select Committee on Telephones reported with reference to telephone competition that it should be carried on by a distinct and separate branch of the Post Office, and should in future be conducted under strictly business-like conditions by a staff specially qualified for such a duty. This recommendation seems to have been put aside on the ground that the telegraph service had been merged into the postal service, and that there were serious objections to separating the department which was responsible for telephones from that directing the telegraphs. At that period this fortuitous combination of circumstances may have been natural, but we think it was a mischance for the telephones. In Sweden, Norway and Denmark the telegraph and telephone department is quite separate from that of the mails, and after years of experience this arrangement is in those countries held to be entirely justified. In Canada and the United States the mails are in the hands of the State, and the telegraphs and telephones are under private management with a certain degree of State control or regulation; and the marked progress of telephone development in all these countries is quoted as showing that the telephone administration has been handicapped in this country by its association with the mails. In the United Kingdom the carriage of letters has always been upheld as the main foundation on which Post Office management rests, and when the telegraph and telephone undertakings were in turn transferred to the Post Office, it seems to have been decided to patch them into the existing organisation rather than to alter the organisation to suit the extended conditions. This plan cannot rightly subsist if great telephone extension is the need of the country and should be its policy. Telephone business is essentially commercial, and if it is to be developed adequately it must be administered on commercial and somewhat independent lines. The official Post Office witnesses stated in evidence that the separation would involve great difficulties, while other competent representative authority supports it.
>
> "Your Committee consider that the re-organisation of the telephone administration on more commercial lines is the fundamental requirement for efficient development, and that if it is carried out wisely it will prove a solution of most of the failings which have been disclosed. They accordingly recom-

> mend the separation of the telegraph and telephone department on the one hand from that of the mails on the other."

In suggesting methods whereby its recommendation as to the separation of the wire services from the postal service might be effected, the Committee recommends the creation of a Department of Communications organized along functional lines—at least in so far as supervisory positions are concerned—the development of this organization to be entrusted "to a body largely composed of men of wide administrative experience not connected with the Civil Service."

The only other point of general interest in the report in regard to organization is a brief but perhaps significant reference by the Committee to the possibility of turning the telephone service back to private operation:

> "There is another topic which should be touched upon under the heading of organisation. It is not within our reference to consider the restoration of the telephone service to private enterprise, for which practically all United States authorities claim advantages."

Matters of Administration

Under the heading of administration, the Committee discussed many matters, chief among which from the standpoint of interest to telephone men in the United States is the matter of service in rural areas.

The almost total failure of the British Post Office to provide service for the population of the rural areas is well known. Indeed, rural development is practically unknown, or at least entirely inadequate, in the case of nearly every country in which telephone service is operated by the Government, largely because the needs of the farmers have not been properly considered in the preparation of Government rate schedules. This fact is recognized by the Committee, which takes the position, in general, that if the Post Office itself is not prepared to furnish service in rural areas, it should not unreasonably restrict the initiative of the farmers in arranging to provide telephone service for themselves:

"Another fundamental question of policy is the following. It must be definitely determined whether the Post Office telephone administration is to be entirely responsible for the development of all telephone service, or should on occasions let someone else perform it under Post Office sanction. Take, by way of illustration, sparsely-populated agricultural districts. Is the Post Office to employ its own official exclusively to maintain the service, or ought it to delegate a certain amount of responsibility to the subscribers themselves? Upon the correct solution of the problem here involved hangs largely the future of rural telephone development.*** The witness who represented the National Farmers' Union advocated semi-private lines under Government supervision or licence, and seemingly desired that farmers should put up the wires and maintain the line. In Canada and the United States there are hundreds of small rural telephone companies or groups where the members construct and operate a telephone system for their own use, linking up with the central system and paying a flat rate of from $3 to $9 per telephone for switching service. * * *

"Your Committee are of opinion that the Post Office has not taken a sufficiently broad view of this general question of rural telephone development, and has failed to realise that the advantages of extending the system into rural areas are shared by other classes of subscribers. It is incumbent on our telephone administration to have a definite policy of development, and it should consider how far, in the interests of the system as a whole, it is prepared to go towards making the telephone service available throughout the Kingdom at a cost within reach of the inhabitants of rural areas. In other countries the initiative is usually taken by the prospective subscribers, and, though allowance must be made for different national characteristics, your Committee believe that a great deal might be done in country districts here to stimulate greater co-operative effort."

American telephone men will naturally agree with the principle involved in the Committee's recommendations as to the employment of private initiative in the development of rural areas. Even under British conditions, however, there are probably two sides to the proposition somewhat timidly advanced by the Committee that municipalities and other local authorities not necessarily in rural areas be permitted to meet their own telephone needs under certain circumstances and

with certain safeguards. It seems significant that the Committee should recommend that:

> "Any area should be allowed to become responsible for its own telephone system on condition that it can show that (i) telephone facilities are not available at reasonable rates; (ii) a responsible authority is prepared to undertake the work; (iii) proper financial guarantees are forthcoming; and (iv) definite plans and estimates have been prepared, and opportunity given to the Post Office for approval or criticism. Should the purchase of existing plant be contemplated, the value would be assessed by the Railway and Canal Commission unless the parties could agree upon the price to be paid. If new plant is required, it might be supplied at cost price through the Post Office, which by reason of the large purchases the Post Office makes ought in ordinary circumstances to be at less cost than the responsible authority could purchase for themselves."

It is also interesting to note that the Committee made no sweeping declaration either in favor of or against automatic telephony. After briefly commenting on this type of apparatus, the report states:

> "The quality of the service is a point on which public opinion has a right to be heard, but the means of attaining it is a technical matter which is chiefly one for the administration."

In the domain of finance, the Committee was naturally desirous of suggesting possibilities for reductions in expenses which would permit a general rate reduction; the report, however, contains only two recommendations of this character. First, it recommends that there be a substantial reduction in the amounts currently charged against revenue in respect of depreciation. The reasoning behind this recommendation is by no means clear, and it is impossible without more information on the accounts and finances of the system in recent years than has been made public to reach a definite conclusion as to the soundness of the Committee's views in this technical matter. Second, the Committee recommends a change in accounting practice by which the overhead expenses in connection with new construction and renewals would be charged to capital account and to the "Depreciation

Account," respectively, instead of being "debited to the year's revenue" as is the present practice. So far as the brief reference to the matter in the report permits conclusions to be drawn, and without a clear understanding of the term "overhead expenses" as used, the changes involved in this recommendation appear to be in accord with the Bell System accounting practice whereby certain overhead expenses are distributed over direct charges to Construction, Removal and Maintenance costs—the portion cleared to Removal expense being charged ultimately to the Depreciation Reserve. The Committee estimated that the reductions in operating expenses that would result from the adoption of these recommendations would be equivalent to a horizontal rate reduction of probably not less than 8 per cent.

Before leaving the subject of administration, the Committee cited an example of the unfavorable reaction of deficient administration upon service:

> "Delays in transmission are traceable to several sources, the chief among them being an insufficiency of trunk lines. The trunk system, which has been operated by the Post Office since 1896, is admitted by them to compare unfavourably with the long distance service in America, and your Committee believe the main cause to be that the Post Office do not persistently grasp the fact that the public will not freely use the system unless they can rely upon prompt communication at the lowest possible tariff, and that the provision of really adequate facilities creates a demand for trunk service."

Rate Matters

In considering the comments and recommendations of the Committee in regard to telephone rates, it should be remembered that the rates in effect at the time of the Committee's inquiry were substantially those proposed by the Post Office Departmental Committee on Telephone Rates in 1920 and put into full effect April 1, 1921. These rates put every subscriber in Great Britain upon a readiness-to-serve charge system of rates, without differentiation between business and residence service.

The readiness-to-serve charge was $37.40 (£8–10–0) in London; $35.20 (£8–0–0) in the largest four cities except London (Birmingham, Glasgow, Liverpool and Manchester); and $33.00 (£7–10–0) *in all other places.* The rate for each local call was 2¾ cents (1½d.) and was *the same throughout Great Britain.* Party lines were not provided for, except in the case of subscribers distant more than a mile from a central office.

It would be interesting to undertake a detailed comparison of telephone rates in Great Britain and in the United States. It is obvious, however, that such a comparison would be exceedingly difficult, if not impossible, since proper allowance cannot be made for the influence of such factors as the difference in price levels between the two countries, the radical difference between the structures of the rate systems, and the equally important differences in the scope and quality of service provided under the rates. Nevertheless, it is possible to compare approximately the average telephone rate increases which have taken place in the two countries since the beginning of the World War. In Great Britain the increases carried by the rates introduced on April 1, 1921, brought exchange rates to a level officially estimated to be 80 per cent. over pre-war and brought toll rates to about 100 per cent. above pre-war. In the United States the exchange rates of the Bell System were only about 35 per cent. higher at the end of 1921 than in 1914, while the toll rates were only about 20 per cent. higher.

In setting up their rate system, the Departmental Committee on Telephone Rates was largely influenced by the cost-of-service theory of rate-making. The Committee attacks this theory in the very first paragraph of that section of its report which deals with rates, quoting with approval an American statement made in 1901, or over 20 years ago, that "it is wise and just to base rates on other considerations than cost" in large as well as small communities. In the Committee's own words:

"The preceding observations bring into prominence the conclusion that general telephone extension and rural telephone development are very closely allied, because rural development has little chance of taking place freely without distribution of expenses on the basis, just suggested, of value for services rendered. * * * It is an acknowledged circumstance that a high development in residence telephones is a great factor in accelerating general development, and this consideration leads to the prevalent practice in Canada, the United States, and other countries of offering residence connections at lower rates than business connections, although such a course cannot always be justified on a cost basis. * * *

"It is no doubt easier to make a uniform rate which applies to the whole of Great Britain. * * * But the inflexibility of such a rate militates against development, as it ignores local conditions and the linking-up of community of interests which can so judiciously foster it. In agricultural districts, for instance, communication with a market town is often a crucial matter, and such rates cannot be satisfactory if based on absolute distance. Numerous instances of hardship inflicted by the rigid application of one adamantine rule for differing conditions have been brought before us. Forcible argument has been adduced against rural areas, which have natural disadvantages arising from few or remote subscribers, having to pay the same uniform rate as in town areas. If they cannot be supplied more cheaply, they ask to be allowed to try for themselves. While your Committee fully recognise the necessity for basic principles, the application of these principles to local requirements should be a matter of careful study with a view to obtaining the maximum traffic at the lowest possible cost."

These are strong statements, but there will be little inclination on the part of telephone men in this country to dispute the principles which they express, or to disagree as to the restrictive effect upon development of the kind of rate schedule to which they refer.

In regard to the total abolition of flat rates in all exchanges and the setting up of a universal system of readiness-to-serve charges with no differentiation between business and residence service, which were effected by the April 1, 1921, rate change, the recommendations of the Committee are either not comprehensive or not technically sound. The utmost that the Committee felt able to recommend is the following ("message rate"

being the equivalent of "readiness-to-serve" in Bell System terminology):

> "Your Committee, after giving their most careful attention to all the above considerations, have arrived at the following conclusions:—(i) We recommend that the message rate be the broad basis of any method of charging; (ii) we are convinced that for business lines in a large city the flat rate stands condemned, while for very small places or for residences in restricted areas, although theoretically objectionable, it may be the means of accelerating development; and (iii) on the ground that development will be encouraged, we think that, without departing very largely from the basis of the message rate, some principle of differentiation or elasticity is desirable, as, for instance, by charging a lower annual installation rental for residences than for business premises."

Experience in the United States indicates that the conclusion that the readiness-to-serve charge system of rates is the proper basis for charging is fundamentally incorrect. Such a system of rates restricts use of the telephone to a marked extent, thereby reducing the value of the service and tending to restrict development. It would appear that the desire of the Committee, frequently expressed in its report, that telephone service should be widely distributed in Great Britain is not likely to be realized under such a rate system.

The final conclusion of the Committee as to rate reductions, which is of a very general character and is based apparently upon their consideration of possible reductions in operating expenses, is given in the following statement:

> "If our conclusions are approved, we recommend an immediate reduction of 10 per cent. on subscribers' accounts provisionally and without prejudice to any subsequent rearrangement to carry out our recommendations."

The Committee's report ends with the following comment:

> "Your Committee are very much alive to the fact that the financial success of some of these recommendations is dependent upon a better spirit of co-operation between the Post Office and the public. To secure this success a more sympathetic recogni-

tion is vital by the Post Office, on the one hand, that the public are human beings with human feelings and frailties, and not mere automatons for making the telephone accounts balance; and by the public, on the other, that there are often real hidden technical difficulties and that an attitude of chronic suspicion does not help to solve them."

The Aftermath of the Investigation

Just what will be the ultimate effect of the findings and recommendations of the Committee upon the future administration of telephone affairs still remains to be seen. As regards telephone rates, a downward revision of rates to take effect July 1st of this year was announced by the Post Office shortly after the publication of the Committee's report, this revision apparently being based upon the decline in wages, amounting to about 20 per cent., which has arisen out of the reduction of cost of living bonuses which has followed the fall in prices. However, the announcement of the new rates indicates that no change in the readiness-to-serve charge system of local rates has been made, except that a moderate differential has been provided in the readiness-to-serve charge as between business service and residence service.

As regards the organization and administration of the service, Post Office authorities have definitely stated that the Committee's proposal for the separation of the wire services from the postal service will not be accepted; and, so far as is known, no official action has been taken as to any of the other vital improvements which were so forcefully recommended in the Committee's report.

In its report, the Committee was not slow to praise American telephone organization and its results; and the telephone men and women of the United States may rightfully feel gratified at the favorable recognition accorded by the Committee to the service, development and administrative methods for which they are responsible. However, when the adoption of American methods

is recommended in government organizations, the inflexibility of governmental institutions proves an insurmountable barrier.

S. L. ANDREW.

Editorial Note:

It is difficult to reach an exact conclusion as to the amount of reduction in the new rates, announced by the Postmaster General to take effect July 1st, as compared with the rates which were superseded. Apparently, however, the new rates still leave the general level of exchange rates about 60 per cent., and of toll rates about 80 per cent., higher than before the War. The following extract from a debate in the House of Commons on May 4th on Post Office affairs shows that some of the suggestions made by the Parliamentary Committee were considered by the Post Office in determining the new rates, and also illustrates some of the difficulties which arise in attempts to compare British rates with American rates:

"THE POSTMASTER GENERAL (Mr. Kellaway):

"I come now to a part of the service which has always occupied my mind a good deal, and that is the provision of improved telephone facilities in the country districts. The present charges are undoubtedly prohibitive, and amount in a great number of cases to a rental of as much as £20 ($88.00) per annum. This is due to the fact that you have heavy capital charges in connection with most of the rural extensions. The Select Committee attach great importance to this point, and I have been influenced a great deal by their recommendation on this subject in the proposal which I am about to make. Where not less than eight subscribers can be obtained the rental will be £8 ($35.20). The instalment rental will be £8 ($35.20) per subscriber, the local and trunk fees being charged according to the ordinary tariff, and in the case of subscribers at a distance of more than one mile extra mileage will be charged at the standard rate. I think that is a very substantial reduction compared with the present rates. (An Hon. Member: 'What is the amount of the reduction?') The present charge is £20 ($88.00) and it is proposed to reduce it to £8 ($35.20), and therefore the amount of the reduction is £12 ($52.80). A day service only will be provided for this class of users, but the cost of the night service, if required, can be met by an additional charge on the subscribers themselves.

"LIEUT. COLONEL WHELER: 'What does a day service actually mean?'

"MR. KELLAWAY: From 9 A.M. to 7 or 8 P.M. It will be necessary in this case to ask for an agreement for a minimum of three or eight years, according to the capital cost involved."

(Rates in Great Britain have been converted into U. S. dollars at the current rate of exchange.)

Conference of Personnel Group

IF anybody was to ask me what was discussed at the recent conference of the Personnel Group which I had the privilege of attending in April, I should answer in two words—"Team Work." The conference held continuous sessions for a week and all of the papers and the discussion dealt with team work and the results which can be accomplished through it—team work between all employees and all departments; team work, which involves everyone from the youngest splicer's helper to the superintendent of plant; from the newest operator to the superintendent of traffic; from the clerk last enrolled in the commercial office to the general commercial superintendent; from the office boy to the general manager and the president. Team work was discussed from every point of view: from the point of view of the morale which must go with it; of the confidence there must be between the various individuals of the organization and the various sections of the organization; from the point of view of the information that the members of the team must have as to objectives, and from the point of view of what the objectives themselves were and should be.

Comparatively speaking, the team work of the Bell System has always been good. The system has been noted among industrial and public service corporations for this characteristic. During and immediately subsequent to the war, however, there was a general let-down in the morale of all organizations and the Bell System was not free from the effect of these influences. Immediately after the management of the telephone properties was returned from Federal control by the Postmaster-General, an intensive study of this question was taken up and efforts were made throughout the whole Bell System, not only to restore the morale and the team work to the pre-war standards, but to exceed these standards wherever possible, and without question it is always possible to exceed a team work standard, because

it is impossible to conceive of team work which is so perfect that it cannot be better.

The record of achievement which was reported at the conference was truly a remarkable one, not only in what had already been accomplished, but in the clear indications of what still can be attained by continued and further applications of the work discussed. What took place at the conference may be naturally divided into three parts.

First—reports by representatives of the general staff in regard to the objectives and plans in connection with operation and the part that employees' representation could take in assisting in the attaining of these objectives. Mr. R. H. Burcher, Assistant Vice President, presented a paper on "Operating Objectives of the Bell System and How and Where Personnel and Public Relations Activities Can Help to Attain Them." Mr. R. F. Estabrook, Traffic Results Engineer, presented a paper entitled, "Carrying Out the Public Relations and Personnel Relations Policies in Traffic Work," and Mr. F. P. Valentine, Assistant Commercial Engineer, gave a paper on "Some Business Aspects of Telephone Operations."

These papers combined gave a picture of the operating problems from the Plant, Traffic and Commercial standpoints, discussing the objectives and showing how through team work and the cooperation of all results could be obtained which otherwise were not obtainable.

Second—were a number of papers of operating officials of various Associated Companies dealing with the work already accomplished through employee representation. Mr. H. L. Badger, General Superintendent of Plant, Bell Telephone Company of Pennsylvania, described employee representation in the Plant Department of that company. Mr. Verne Ray, Superintendent of Maintenance, Illinois Bell Telephone Company, described the operation of the public relations committees and the pink ticket plan in use in Chicago. Employee representation in the Traffic Department of the American Telephone and Telegraph Company was discussed by

Mr. J. L. R. Van Meter, General Traffic Manager of the Long Lines Department, and the operation of service committees in the Traffic Departments was described by Mr. R. L. Barrows, General Supervisor of Traffic, Bell Telephone Company of Pennsylvania; Mr. Hermann Thomas, General Supervisor of Employment, Long Lines Traffic Department, American Telephone and Telegraph Company, and Mr. B. J. Bowen, General Superintendent of Traffic, New England Telephone and Telegraph Company. "Demonstration Switchboards—Their Usefulness with Employees and the Public," was presented by the Honorable Franz C. Kuhn, President of the Michigan State Telephone Company.

Third—were papers which dealt particularly with team work for other than the operating features of the telephone problem. The Hon. D. F. Houston, President of the Bell Telephone Securities Company, gave a talk on telephone financing and sale of preferred stock to subscribers; Mr. W. P. Banning, of the Information Department of the American Telephone and Telegraph Company, talked on "Motion Pictures for Employees and the Public," and Mr. W. J. O'Connor, of the Southwestern Bell Telephone Company, on the "How and Why of Personnel Work in the Bell System."

The papers referred to above, all of which except Mr. Houston's have been printed and distributed, by no means include all that came before the conference. Oral reports were made by many operating officials and others of the results which they had been obtaining. These reports were equally as interesting as the papers, and even they left undescribed much which is going on in various companies. Mr. J. P. Downs, General Traffic Manager of the New York Telephone Company, discussed public relations work in the Traffic Department of that company, and Mr. W. H. Winter, General Superintendent of Plant of the Bell Telephone Company of Canada, made a most interesting statement as to the results of work through employees' representatives in the plant department of the Bell Telephone Company of Canada.

Reversing the usual procedure of former conferences of the Personnel Group, this conference was developed along the lines of a report to the Personnel Representatives of the Bell System, from people directly concerned with operating conditions, as to what had already been accomplished through personnel work to improve the morale and team work within the system and to improve public relations through the contacts of the operating departments with the public, together with numerous suggestions as to what might be accomplished in the future.

The records presented definitely established the following facts with reference to the efforts to secure better team work. That it has resulted in a higher degree of satisfaction on the part of every employee in his work; that it is a powerful aid to greater efficiency and economy in the day to day operations of the business and in improving its public relations, and that in the future, to an even greater degree than in the past, the ability to effectively lead in such work will be among the important characteristics which will be found in successful operating executives.

Another vital fact which was definitely established by the record seems to me to be that under the right treatment and given proper information in regard to the business and their relations to it, all employees appreciate as never before that their interests are identical with the interests of the management, the owners, and the public, and depend in the long run upon the success of the enterprise. One of the most striking features brought out has been the response of the general forces to the information given them enabling them to appreciate their relations to the large objectives of the business. The response of the general forces to such information indicates perhaps that there has not been in the past a full appreciation of the high intelligence and the keen interest which the general forces take in their jobs. In some cases it may have been felt that the younger forces especially would not understand or be interested in

facts about the business, but recent experience shows they are not only interested, but can deal with the facts skillfully and helpfully once they get them. All of the general forces are essentially the same type of human beings as the supervisory forces (most of whom have been developed from the general forces) and while they may not in most cases have had the same opportunities or experiences, they are working for the same objectives and, if they have the proper information in regard to the business, with the same and often with even greater enthusiasm.

I know that every man and woman at the conference, left deeply impressed with the effectiveness of "team work" and determined that in the Bell System, we should work to the end that each member of the organization should know the objective of the business so as to do, understandingly, his or her part of the work and be able to contribute in the highest degree to the ideal "Good service, continuously rendered at as low rates as consistent with a fair return to the owners."

BANCROFT GHERARDI.

Business Principles in Organization Practice

CONSIDERATION of many telephone problems, and close contact with a large number of telephone men, has led to the belief that the following observations, by no means new, are worth reiteration.

In nearly all countries the telephone service, whether privately or governmentally operated, is furnished, in principle at least, as a commercial service in the sense that it is expected to be self-supporting. When governments operate, the theory is avowed that the service should neither be a charge upon the general revenues of the government, nor a substantial contributor to the general revenues. In practice, the government-operated systems do not succeed as businesses, and fail either to be self-supporting or to be adequate from a service standpoint.

In the United States, telephone service is not only furnished as a commercial service, but it is successfully operated as a business. It is almost universally the opinion of telephone men in this country, based on observation, comparison and experience, that telephone service can be and is best rendered as a commercial service. This means that the service is best managed in accordance with business principles.

The organization of the Bell System is such as to promote the conduct of the telephone business as a whole in this country along sound business lines to a greater extent than probably obtains in any other industry in the country. Despite the fact that this organization is nicely adjusted to facilitate the conduct of the enterprise as a whole along consistently sound business lines, the necessity for sound business management, particularly in local operations, should be continually emphasized. The size of the organization, its subjection to public regulation, the necessity for great specialization in the work for technical reasons, and the requirement of universal service, are all factors which tend to obscure the essential character of local operations, and to make

difficult under many conditions the application of business principles in detail.

Progress a Business Necessity

The most important principle in any business is that it must persistently progress. I doubt if any useful business, regardless of its character, can be successfully continued except on the basis of fundamental progress. This progress must be real. In practical terms, it means that product must be improved and real prices reduced. In the telephone business, it means that the ultimate objective of the entire organization in doing the day's work is that service will be better and cheaper as time goes on. Such progress has consistently been made by the Bell System from the beginning. Telephone service was never better, more extensive, or so cheap as it is today; and such nominal increases in rates as have been necessary in very recent years do not refute this statement, for they have not approached the corresponding change in the value of money.

The necessity for fundamental progress as a business proposition will hardly be questioned. The essential problem of business management is to accomplish this progress in a balanced and systematic way. Net earnings must always be adequate, or retrogression, not progress, is the immediate result. Service should not be improved without regard to the value of the improvement to the public, or without regard to the cost to be borne by the public; nor should costs be decreased at the expense of adequate service. The standard of transmission, the speed of answer, the speed of installation, the speed of maintenance, the frequency of directories, the terms of credit, the quantities of spare, the flexibility of plant and of organization—these are a few of innumerable cases where the essential problem is one of business management. The correct solution is a continuing problem, calling for constant adjustment for differing and for changing conditions. The objective is constantly to increase the value of service, not merely or necessarily to make it technically

perfect; and to reduce costs by increase in efficiency, not by reduction of service.

The two most important single factors, from the standpoint of organization, in the progressive reduction in cost and improvement of service simultaneously, have been the functional organization of operations, and the centralization of development work, which is correspondingly functionalized. Without these two organization developments, it seems certain that progress in the business could not be had, or would be disastrously limited. They have almost automatically made progress; but they must be perfected to result in the coordination of technical and functional progress to business and service progress as a whole.

Improving Functional Organization

It seems to me that continued and intensive attention is required that may be described as effort in the direction of *perfecting* the functional organization. This effort must be exercised along three different lines. The first two have been given a great deal of consideration, and will be only briefly mentioned here. The last method is one to which I believe special emphasis is due now.

1. Maintenance of cooperative attitude between department officials.
2. Establishment of interdepartmental instructions that provide improved methods of interdepartmental work, and of departmental instructions that facilitate businesslike treatment of departmental and interdepartmental business.
3. Development of the practice of promoting and transferring men to different departments.

The first method has to do with supervision, education, morale, and team play; the second with forms of organization, authorities, and organization machinery; and the third with the qualifications of men and the training of management personnel.

From the business standpoint, the test of every functional officer should be first as to his telephone business qualifications. He must, of course, be able to conduct functional activities expertly, but he must be able to make the functional performance harmonize with and contribute to the business and broad service objective, and so as not to conflict with and detract from the results as a whole. Men must not be known merely as accountants, traffic men, plant men, commercial men, engineers, but first as good telephone men assigned to the management of accounting work, traffic work, plant work, commercial work, engineering work.

Advantages of Experience

Good telephone business men are not made by calling them by new names. The name must be justified by the fact. One of the methods of securing the proper development of telephone business men is to avoid extremes in the confinement of men to single functions. There will always be a reluctance to transfer men from one function to another, or for men to welcome transfer, because of the loss in technical proficiency temporarily suffered, and because some uncertainty is inevitably involved in any change. It will be necessary to take a broad attitude, and to insist that to attain exceptional technical proficiency, at the expense of adequate all-around business sense in the organization, retards business and individual progress.

It is especially true that in the commercial department, all-around telephone business men are required. In general, men can more safely be relied upon to properly represent the Company or to advise soundly on local telephone business problems, who know the telephone business as well as outside conditions and how to deal with them. Good traffic men and good plant men who like affairs in general and individual and mass contact with the public, should be given opportunities to manage the "commercial" part of telephone work. This promotes the business as a whole, and therefore the proper development of true departmental efficiency.

The job is to find out what the people want to buy, to sell what they want to buy without asking them to pay for what they don't want, and to produce it and deliver it in a manner satisfactory to the buyers, so that they will be glad to pay for it. To do this better every year is good business and good service. Nothing else is either good business or good service. This is the standard we set ourselves in serving the public, and should be the first to consider in shaping organization and in selecting the management personnel.

C. I. BARNARD.

Progress in Cooperation with the National Electric Light Association

THE annual convention of the National Electric Light Association held at Atlantic City in May marked another milestone in the progress of our cooperative relations with the electric light and power utilities. At the invitation of the Association, about fifty representatives from the American Telephone and Telegraph Company and nearby Associated Bell Companies attended the convention and the cordial spirit in which they were received by the electric light and power representatives shows how effective have been the efforts to "get-together with the other fellow" and argues well for the future of our joint work.

An outstanding feature of the convention was the presentation of the second progress report of the Joint General Committee of the National Electric Light Association and Bell Telephone System on the Physical Relations between Electric Light and Signal Systems. This second report presents detailed principles for the inductive coordination of supply and signal systems and prepares the way for the early formulation of a code of practices. Copies of the report have been sent to all the Associated Companies.

The Joint General Committee earnestly recommends the adoption and consistent application of these principles by the respective utilities, and expresses their belief that the principles should prove of great benefit in meeting the mutual problems of the utilities and that they point the way to the practical solution of inductive interference situations. Gratification is also expressed by the Committee as to the constantly increasing spirit of cooperation evidenced by the satisfactory way in which the mutual problems of the two utilities are being dealt with.

This second report of the Joint General Committee was presented at the Atlantic City convention by Mr.

Pack for the National Electric Light Association and Mr. Gherardi for the Bell System. The keynote of Mr. Pack's statement was that by establishing close contact between representatives of the two utilities so that they would have full confidence in each other, the way was paved for the proper coordination of facilities in accordance with the principles set up in the report. He also called attention to the great progress in solving the problems between the two utilities in the past year and said that he hoped the spirit embodied in the reports would be continued in the application of the principles in the field. Mr. Gherardi also emphasized the satisfactory progress which has been made in the mutual understanding of the problems between the two utilities and stated that it was being brought about by better contact and increasing confidence. If he could make but one contribution to the solution of the problem, Mr. Gherardi said it would be to have the employees of one utility know, personally, the corresponding employees of the other utility with whom they deal, for through such contact a sympathetic understanding of our mutual problems will be promoted. The discussion of the report showed that through friendly personal relations and frank discussions the way had been opened to the proper engineering solution of the problems between the two utilities.

Among others who spoke in connection with the presentation of this report were engineers from several state public service commissions, and they expressed their appreciation of the successful efforts being made by the utilities to solve their mutual problems through the formulation of constructive guides to practice.

As a result of the meetings and discussions between the representatives of the National Electric Light Association and those of the Bell Telephone System at the Atlantic City Convention, it is believed that the mutual friendship and understanding between the two utilities have been greatly strengthened.

H. P. CHARLESWORTH.

Technical Papers Published During the Quarter Just Ended

Analysis of the Energy Distribution in Speech,[1] by Dr. I. B. Crandall and Dr. D. MacKenzie, gives the results of over 13,000 observations on both continuous speech and separate syllables and yields, among others, the result that about 60 per cent. of the energy of speech is concentrated in frequencies below 500 cycles per second. This is at variance with the work of earlier investigators.

The Nature of Speech and its Interpretation,[2] by Dr. Harvey Fletcher, making use of the results of the preceding paper in addition to a very extended series of observations which Dr. Fletcher has collected, arrives at the important conclusion that in a telephone circuit in which all frequencies below 500 cycles per second are suppressed and in which therefore 60 per cent. of the energy in speech is suppressed (see preceding paper) the "articulation" or intelligibility of the speech is reduced only 2 per cent. below that of a perfect telephone circuit. If all frequencies below a thousand cycles are suppressed, only 16 per cent. of total speech energy remains to be transmitted by the telephone circuit while the *loss* in articulation is only 14 per cent. It is pointed out by the author that these striking results may be of use to medical specialists in alleviating the handicaps of deaf and dumb persons as well as being of value to the telephone engineer and in turn to the telephone using public.

The Physical Examination of Hearing and Binaural Aids for the Deaf,[3] by R. L. Wegel, discusses many of the recent results of speech analysis arrived at in the Bell System laboratories with special reference to pathological conditions of the ear.

[1] See Physical Review—Vol. 19, p. 221-232, 1922.

[2] See Journal of the Franklin Institute, Vol. 193, p. 729-747, 1922.

[3] Presented before the National Academy of Sciences—Washington, D. C.—April 25, 1922. To appear shortly in the Proceedings.

The Relative Sensitivity of the Ear at Different Levels of Loudness,[4] by Dr. D. MacKenzie describes an alternation phonometer which makes it an easy matter to adjust to equal loudness two tones of different pitches. He finds that the sound energy necessary to produce a given loudness is smaller the higher the pitch within the frequency range from bass G to C 5.

Loud-Speaker Developments: At the meeting of the National Academy of Sciences in Washington on April 25th, Dr. F. B. Jewett, Vice President of the Western Electric Company, read a paper[5] discussing the technical aspects of the loud-speaker. Dr. Jewett reviewed the history of loud-speaker development pointing out that all attempts, prior to the coming of the distortionless amplifier, were doomed to failure. It was only when such an amplifier became available that the engineer, in designing a loud-speaker, could choose his transmitter on the basis of distortionless reproduction rather than on the basis of efficiency of conversion of sound waves into telephone current. The amplifier has made the use of the distortionless transmitter possible.

However, the problem of the loud-speaker does not lie entirely in the amplifier. After the telephone current has been generated by the transmitter and its energy has been amplified possibly a thousand million-fold by the amplifier, it is then necessary to reconvert it back into sound waves. To accomplish this, a special receiver and the proper type of horn to attach to the receiver are necessary. The receiver and horns which the Bell engineers have perfected represent a joint development since a horn when attached to a receiver brings about a marked change in the operating characteristics of the latter.

Composite Telegraphy and Telephony,[6] by Mr. J. H. Bell of the Engineering Department of the Western

[4]Read before the National Academy of Sciences—Washington, D. C., April 25, 1922. To appear shortly in the Proceedings.

[5]To appear shortly in the Proceedings.

[6]Post Office Engineers' Journal, Vol. 15, p. 1-12, 1922.

Electric Company, describes the American practice as being of interest to readers of the British Post Office Engineers' Journal.

Planning a Big Business Ahead: In this article, appearing in "The Nation's Business," for April, 1922, Mr. S. L. Andrew, Chief Statistician of the American Telephone and Telegraph Company, discusses briefly some aspects of the statistical work of that Company in so far as it concerns future planning for the Bell Telephone System. The article points out the need for careful statistical measurement of the influences of both internal and, especially, external forces upon the movements of the business. It emphasizes the value of scientifically determined estimates over estimates reached by "hunch" methods. Mention is made of the graphic records of the movements of the principal elements of its business which are prepared by the American Telephone and Telegraph Company for purposes of executive information and control. The opinion is expressed that effective statistical work is profitable from every point of view, not only in the telephone business but in every business. Any business that wants to know what is ahead must first have at its disposal all practical knowledge of what is behind.

Notes on Recent Occurrences

THE SHIP-TO-SHORE RADIO DEMONSTRATION AT HARRISBURG

THE first public demonstration of the combined use of ship-to-shore radio telephony, the regular telephone system and the telephone loud-speaker was held at Harrisburg, Pa., on the evening of April 6, in connection with an address by John J. Carty, Vice President of the American Telephone and Telegraph Company, in charge of development and research, before the members of the Harrisburg Radio Association and their guests.

Earlier in the day General Carty and Leonard H. Kennard, President of the Bell Telephone Company of Pennsylvania, had been guests of honor at a luncheon given by the association. The evening meeting was held in the ballroom of the Penn-Harris Hotel, which was crowded to capacity by the 500 or more members of the association and their guests. A special installation of the telephone loud-speaker had been made under the direction of engineers of the Long Lines Department, and this was used by General Carty in delivering his address, as well as in connection with the demonstrations which followed it.

General Carty's subject was "Achievements in Telephony." He outlined graphically the development of the telephone art from the date of the invention of the instrument by Dr. Bell to the present time and briefly discussed its probable future, particularly with regard to the use of radio telephony. He was roundly applauded when he declared, "The progress which we have made, and some of which I will endeavor to sketch briefly for you tonight, justifies me in the belief that in due course American scientists will show the way to construct a telephone system connecting the entire world, so that the tens of millions of telephone users in the United States can readily talk, not only as they now are doing among

themselves, but also with anyone who has a telephone, wherever he may be located on the face of the earth."

On the wall of the ballroom was hung a map of the United States and Cuba, showing the Transcontinental Line and the Key West-Havana cable. Repeater stations were indicated by lights, which were illuminated as General Carty "called the roll of the continent," a light flashing as each repeater man came into the circuit and answered as the name of his station was called. General Carty talked for some time with H. G. Bates, commercial representative of the Pacific Telephone and Telegraph Company, in San Francisco, the entire conversation being heard by the audience. A musical program followed, an attractive feature of which was a violin solo by Mr. Bates' fourteen-year-old daughter.

The circuit to Havana was built up and the audience heard General Carty's conversation with F. T. Caldwell, chief engineer of the Cuban Telephone Company, as well as phonograph selections played at Havana.

Demonstrations of receiving wireless telephone messages sent from the Deal Beach, N. J., radio station were given and General Carty introduced a touch of the dramatic when he announced that an attempt would be made to talk with a ship at sea. This feature of the program had not been advertised and caused something of a sensation among the guests.

The Shipping Board liner *America*, then en route for New York, was about 400 miles off the coast. Communication with the ship was established without difficulty, wires being used from Harrisburg to Deal Beach and radio communication being effected by means of two radio stations, Deal Beach for sending from shore to ship and Elberon for receiving from ship to shore. General Carty talked with the *America's* radio operator, the conversation being distinctly heard by the Harrisburg audience. The operator declared that he clearly heard the applause which followed his exchange of greetings with General Carty.

Following the demonstration a motion picture film illustrating the principle of the audion or vacuum tube, an essential factor in both radio telephony and wire telephony where repeaters are used, was shown, as was a short film showing the "trick assembly" of a telephone desk set. Many of the members of the association and guests took advantage of an invitation to inspect the control room, in which was installed the vacuum tube amplifying apparatus used in connection with the loud-speaker.

Among the guests at the luncheon and the evening meeting were many of the executives of the Bell Telephone Company of Pennsylvania, and state and city officials, including John S. Rilling, of the Pennsylvania Public Service Commission, who is president of the Harrisburg Radio Association and who presided at the luncheon and introduced General Carty in the evening.

ANNUAL CONVENTION OF THE NATIONAL ELECTRIC LIGHT ASSOCIATION

Atlantic City, N. J., May 16-19, 1922

THE Convention was held on the Million-Dollar Pier, and in order to aid the meetings held in the large auditorium a loud-speaker was installed and used to amplify the voices of local speakers on several occasions. On the night of the 18th, it was connected to the transcontinental circuit terminating in San Francisco, and Mr. J. C. Nowell, Vice President and General Manager of the Pacific Telephone and Telegraph Company, Mr. John A. Britton, Vice President of the Pacific Gas and Electric Company, and Mr. R. H. Ballard, Vice President of the South California Edison Company, addressed the Convention from San Francisco. Before the speeches were delivered from San Francisco, Mr. Gherardi called the roll from Atlantic City to the Pacific coast and the meeting was closed with a "Good Night" roll call.

Secretary Hoover was unable to attend the meeting in person, so on Friday morning the loud-speaker was connected to a Washington circuit and he delivered a short address from the Chesapeake and Potomac Telephone Company's office in Washington. On each occasion the loud-speaker was used with entire success.

THE GRANT CENTENNIAL

Point Pleasant, Cincinnati, Ohio, April 27, 1922

THE Centennial was celebrated at Point Pleasant, General Grant's birthplace, with President Harding as the principal speaker. In order to carry the words of the President to the entire crowd which it was expected would gather at Point Pleasant, the Bell loud-speaker was installed. By adopting, on a small scale, the arrangements which were used at the Armistice Day Ceremony, the words of President Harding were transmitted by a telephone circuit to Cincinnati also, where they were amplified and projected by the loud-speaker.

It is estimated that 15,000 people heard President Harding in Point Pleasant and 25,000 in Cincinnati.

ANNUAL CONVENTION OF THE NATIONAL CHAMBER OF COMMERCE

Washington, D. C., May 16-18, 1922

THE Annual Convention was held in Convention Hall in the City of Washington and as a result of the successful use of the loud-speaker at the National Chamber of Commerce Convention in Atlantic City last year, the request of the Chamber to make it available again this year was granted. Convention Hall seats about 4,000 people and the loud-speaker proved of great service in assisting those who addressed the convention, among whom were President Harding and Secretary Hoover, to reach their audience.

DEDICATION OF THE LINCOLN MEMORIAL

Washington, D. C., May 30, 1922

THE installation of the Bell loud-speaker used in connection with the Dedication of the new Lincoln Memorial may be looked upon as ranking in importance with the installations for President Harding's Inaugural address and for Armistice Day. Although the audience did not reach the records set by the two earlier events, the number of persons present was so great that no speaker unaided could have been heard by more than a small fraction of them. The loud-speaker again demonstrated its capabilities by satisfactorily projecting all of a widely varied program including the selections rendered by the Marine Band.

The use of the loud-speaker on this occasion proved interesting from another point of view as it demonstrated how quickly the residents of a city will come to place implicit confidence in it. Had the dedication occurred in any other city than Washington, it is quite likely that the assembling crowds would have arranged themselves very differently than occurred in Washington. There the early arrivals, realizing that they could hear perfectly for at least a quarter of a mile from the Memorial, chose comfortable and shady seats under the more or less distant groves of trees, and it was only after these more desirable locations were all occupied that the audience began to collect in any considerable numbers about the base of the Memorial.

LOUD-SPEAKER DEMONSTRATIONS BY THE BELL TELEPHONE COMPANY OF PA.

Pittsburgh, Pa., April 28-29, 1922

THREE demonstrations were given, the first to specially invited guests from the city of Pittsburgh, the second on Saturday afternoon to the pupils of the technical and high schools of Pittsburgh, and the third

on Saturday evening to telephone employees. The roll of cities was called from Pittsburgh to San Francisco and also from Pittsburgh to Havana. Following this, the Havana and San Francisco circuits were connected together at Pittsburgh, music being received from each end and the two terminals talking together with Pittsburgh listening in. A demonstration of radio broadcasting was also given, the program being sent out from the Bell System radio station at Deal Beach, New Jersey. It was received at Pittsburgh and amplified by the loud-speaker.

On Saturday afternoon and evening, in addition to the use of the San Francisco-Havana circuit, a wire radio demonstration was included in the program, the circuit being operated as follows: by wire from Havana to Deal Beach, by radio from Deal Beach to New York and thence by wire from New York to Pittsburgh. This circuit demonstrated the use of a radio link such as is already in operation between Los Angeles and Catalina. On Saturday afternoon and evening, Gen. John J. Carty addressed the audience from New York, telling briefly of the development and future of the telephone.

THE LOUD-SPEAKER AT FIRST AID CONTESTS

THE Bell Loud-Speaker or telephone amplifier was used on several occasions in connection with First Aid contests held by Associated Companies of the Bell System, notably that of the Pittsburgh Division of the Bell Telephone Company of Pennsylvania at Pittsburgh on April 26, and that of the New Jersey Division of the New York Telephone Company at Newark on May 15.

Each of these contests attracted several thousand telephone employees and guests, and the amplifying apparatus was of great assistance to the chief judges and other officials in making announcements, in stating the First Aid problems to be performed by the contesting

teams, and in announcing the results of the contests and awarding prizes.

In both cases brief addresses were made by company officials, whose voices were carried to the farthest corners of the large exposition building and the armory in which the contests were respectively held. An additional feature of the Newark program was the presentation of Theodore N. Vail medals (bronze) to six New Jersey Division employees by President H. F. Thurber of the New York Telephone Company.

NEW RADIO LAW AND RADIO REGULATIONS

THE Committee appointed by the Secretary of Commerce has made its final report, which is known as "The Report of the Department of Commerce Conference on Radio Telephony." With this report as a basis, Senator Frank B. Kellogg of Minnesota and Representative Wallace B. White, Jr., of Maine, have drafted a bill which has been presented to Congress. This bill provides only for such points as it is necessary to cover as a matter of law and largely leaves to the Department of Commerce the regulation of radio matters in detail. This seems to be very wise, as it would be unfortunate to hamper the development of a new and unformed art with fixed laws which it would be difficult to modify as the necessity arose. Accordingly, if the new bill passes Congress and becomes a law, it may reasonably be expected that the final report of the Department of Commerce Conference Committee will form a substantial part of the basis of such regulations as the Secretary of Commerce may issue.

EXPERIMENTAL BROADCASTING STATION

New York City

OUR new broadcasting station at No. 24 Walker Street, New York City, is completed and ready for service. The Department of Commerce has refused us a

special wave length of 400 meters and we have been assigned the common wave length of 360 meters. This means that we must operate in common with fourteen other broadcasting stations in this zone. The stations which are now operating are using all of the available time and we are now negotiating in an endeavor to obtain suitable hours during which we may begin operations. In order to start in an experimental way and more in the nature of a demonstration of what we can do, we have requested that we be assigned the hours of 11:00 to 12:00 A.M.; 4:30 to 5:30 P.M. each week day, and Thursday evening from 7:30 P.M. to midnight. It is expected that we will receive this assignment in the very near future, and we will then start negotiations with our prospective users of the facilities. Already, without any soliciting or canvassing, approximately one hundred persons have made application.

SUBSCRIBER OWNERSHIP IN WISCONSIN

HOW well the sale of the preferred stock of the Wisconsin Telephone Company carried out the purposes aimed at, namely the distribution of this stock among the users of the service, is illustrated by the following table showing the subscriptions to the stock from various groups of people:

Vocations	*Total Subs.*	*Shares*	*Vocations*	*Total Subs.*	*Shares*
Abstractors	8	61	Book Binders	2	2
Architects	10	29	Bookkeepers and Accts	399	1,477
Artists	11	37	Brass Workers	1	10
Bakers	37	239	Brokers	14	67
Bankers	73	2,629	Butchers	86	354
Barbers	40	109	Candy Makers	4	12
Beauty Parlors	17	30	Caretakers	6	16
Blacksmiths	13	48	Carpenters	52	137
Boarding House Prop	6	18	Carpet Weavers	1	5
Boat Builders	4	25	Casket Trimmers	2	15
Boiler Makers	7	23	Chauffeurs	29	62

Vocations	*Total Subs.*	*Shares*
Cheese Makers	2	5
Chefs and Cooks	24	48
Chemists	10	35
C. S. Pactitioners	6	13
Chiropractors	6	28
Cigar Makers	20	30
City and County Employees	106	541
Clergymen	53	285
Clerks	1,045	2,593
Commission Merchants	2	110
Conductors	9	40
Contractors	64	504
Coopers	1	3
Dentists	74	412
Doctors	183	1,363
Draftsmen	33	103
Dray and Expressmen	19	72
Dressmakers	92	321
Druggists	126	487
Dry Cleaners	3	6
Electricians	80	240
Engineers	63	324
Estates	12	187
Farmers	110	495
Firemen	5	17
Fishermen	1	2
Foremen	79	417
Garage Employees	64	220
Geologists	2	20
Government Employees	89	361
Grocers	136	588
Harness Makers	2	6
Hotel Employees	7	9
Hotel and Restaurant Prop.	47	178
House Maids	40	156
Housewives	2,148	10,410
Inspectors	13	82
Janitors	37	158
Laborers	271	661
Laundry Employees	10	26
Lawyers	90	813
Leather Workers	11	47
Librarians	8	13
Locksmiths	1	1
Managers	386	3,108
Manufacturers	159	3,016
Marble Workers	5	40
Masons	9	35
Mechanics	191	548
Merchants	464	3,025
Metal Workers	4	12
Messengers	2	2
Millers	5	16
Milliners	23	80
Miscellaneous	869	3,281
Motormen	7	54
Moulders	5	25
Musicians	8	81
Newspapermen	66	207
Nurses	85	198
Optometrists	1	15
Painters	33	103
Paper Makers	36	70
Pattern Makers	8	55
Photographers	16	50
Picture Framers	1	10
Plasterers	3	9
Plumbers	30	129
Pool Room Prop.	9	22
Printers	68	255
Railroad Employees	173	568
Real Estate & Ins.	54	505
Retired	271	2,365
Sailors	6	30
Salesmen	464	2,244
Secretaries	31	111
Shipping Clerks	4	9
Shoemakers	38	98
Shoe Shiners	3	3
Steam Fitters	11	35

Vocations	Total Subs.	Total Shares	Vocations	Total Subs.	Total Shares
Stenographers	435	965	Textile Workers	25	50
Students	143	382	Theatre Prop	8	20
Superintendents	79	694	Tinsmiths	10	29
Surveyors	1	2	Toy Makers	1	1
Tailors	55	222	Undertakers	16	61
Teachers	400	1,550	Upholsterers	2	7
Teamsters	26	62	Wagon Makers	2	2
Telegraph Employees	10	39	Waiters	17	35
Telephone Operators	289	426	Watchmen	9	39
Other Tel. Employees	171	612	Welfare Workers	8	21
			Window Washers	1	1
			Wire Weavers	1	4
			Total	11,283	53,473

THE BELL SYSTEM TECHNICAL JOURNAL

IT has recently been decided to undertake the publication of a scientific and engineering magazine devoted to the technical aspects of electrical communications. It is to be known as "The Bell System Technical Journal."

In order that the various engineering branches of the Bell System be directly represented, an Editorial Board has been appointed consisting of Messrs. J. J. Carty, Bancroft Gherardi, F. B. Jewett and E. B. Craft with whom will be associated L. F. Morehouse, O. B. Blackwell, H. B. Charlesworth and E. H. Colpitts. The Information Department of the American Telephone and Telegraph Company has been designated to publish the Journal and R. W. King will act as Editor.

The number of fields of science and engineering which are contributory to electrical communications has increased materially in the past few years and a further change in the same direction is to be expected in the future. The need, therefore, is apparent for a technical journal which will serve to collect, in the most available form, articles in the many diverse fields of engineering and science which in one way or another bear upon electrical communications.

For the time being the contents of the Technical Journal will probably consist entirely of contributions from the technical staff of the Bell System, but it is not intended that this preclude the acceptance of articles by engineers and others who are unaffiliated with the System. The range of subjects treated in the Journal will be as broad as the art of electrical communications itself, including not only the technical researches which underlie new developments in apparatus, but also such subjects as traffic and commercial engineering and the economic studies which precede important new installations.

For the present the Journal will be issued quarterly but with the thought that in the not distant future the volume of articles available may be such as to justify a bi-monthly or monthly appearance.

The Journal will be distributed gratis to interested employees of the Bell System.

THEO. N. VAIL HONORED BY OLD TIME TELEGRAPHERS

IT has been announced that the postal card vote by the membership of the Old Time Telegraphers as to the five men who did the most for commercial development of the telegraph and the welfare of telegraph employees, resulted as follows: Vail, 392; Eckert, 211; Mackay, 200; Clowry, 194, and Carnegie, 181. Consequently, Mr. Vail's picture was selected for a medallion to be distributed during the Association's annual convention in September.